

RECEIVED
CENTRAL FAX CENTER

JUL 25 2006

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. 200302351-1IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Lubbers, et al.

Confirmation No.: 9364

Application No.: 10/043,924

Examiner: Tang, Karen C.

Filing Date: October 22, 2001

Group Art Unit: 2151

Title: System and Method for Interfacing with Virtual Storage

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on April 28, 2006.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:☐ 1st Month
\$120☐ 2nd Month
\$450☐ 3rd Month
\$1020☐ 4th Month
\$1590☐ The extension fee has already been filed in this application.☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.Please charge to Deposit Account 08-2025 the sum of \$500.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed☐ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:
Commissioner for Patents, Alexandria, VA 22313-1450
Date of Deposit:

OR

☒ I hereby certify that this paper is being transmitted to the Patent and Trademark Office facsimile number (571)273-8300.

Date of facsimile: 07/24/2006

Typed Name: Jed Caven

Signature: 

Respectfully submitted,

Lubbers, et al.

By: 

Jed Caven

Attorney/Agent for Applicant(s)

Reg No.: 40,551

Date: 07/24/2006

Telephone: (720) 841-9544

**RECEIVED
CENTRAL FAX CENTER
JUL 25 2006**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:)	
)	
Lubbers, et al.)	Group Art Unit: 2151
)	
Serial No.: 10/043,924)	Examiner: Tang, Karen C.
)	
Filing Date: October 22, 2001)	Confirmation No.: 9364
)	
For: System and Method for Interfacing with Virtual Storage)	

APPEAL BRIEF

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted in response to the final rejections of the claims mailed January 18, 2006. A Notice of Appeal was filed on April 28, 2006.

REAL PARTY IN INTEREST

The assignee of the entire right, title, and interest in the patent application is Hewlett-Packard Development Company.

RECEIVED
CENTRAL FAX CENTER

JUL 25 2006

RELATED APPEALS AND INTERFERENCES

There are currently no related appeals of other United States patent applications known to Appellants, Appellants' legal representative, or the assignee that will directly affect, or be directly affected by, or have a bearing on, the Board's decision. There are currently no related interferences known to Appellants, Appellants' legal representative, or the assignee which will directly affect, or be directly affected by, or have a bearing on, the Board's decision.

STATUS OF CLAIMS

Claims 1-18 are pending in the application. In the Office Action mailed January 18, 2006, claims 1-18 were finally rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,538,669 to Lagueux ("the '669 patent").

STATUS OF AMENDMENTS

No amendments have been filed subsequent to the final rejection.

RECEIVED
CENTRAL FAX CENTER

JUL 25 2006

SUMMARY OF CLAIMED SUBJECT MATTER

The subject matter of the independent claims is summarized below with reference numerals and reference to the specification and drawings in accordance with 37 CFR §41.37.

Claim 1

Claim 1 is directed to a system for replicating data between a first storage location and a second storage location. The system comprises:

a virtualized logical disk object (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) representing a virtual storage container, wherein the virtualized logical disk (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) is an abstract representation of physical storage capacity provided by plurality of physical stores (Fig. 7, reference numeral 712; page 18, paragraph 48, line 1 through page 21, paragraph 54, line 27); and

a virtual disk object (Fig. 1, reference numeral 102; page 9, paragraph 26, line 1 through page 12, paragraph 34, line 31) representing a virtual storage container, wherein the virtual disk object is an abstract representation of one or more virtualized logical disk objects (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3), the virtual disk object (Fig. 1, reference numeral 102; page 9, paragraph 26, line 1 through page 12, paragraph 34, line 31) including an exposed management interface; and

wherein the virtual disk object (Fig. 1, reference numeral 102; page 9, paragraph 26, line 1 through page 12, paragraph 34, line 31) is managed through the management interface to select the one or more logical disk objects (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) represented by the virtual disk object (Fig. 1, reference numeral 102; page 9, paragraph 26, line 1 through page 12, paragraph 34, line 31).

Claim 9

Claim 9 is directed to a method for managing virtual storage in a storage area network, the method comprising:

providing at least one network storage controller (Fig. 5, reference numeral 501; page 15, paragraph 42, lines 15-28) coupled to a plurality of physical disk drives (Fig. 6, reference numeral 605; page 15, paragraph 43, line 28 through page 17, paragraph 46, line 28) implementing physical storage capacity;

creating a physical store object (Fig. 7, reference numeral 712; page 18, paragraph 48, line 1 through page 21, paragraph 54, line 27) representing each of the plurality of physical disk drives (Fig. 6, reference numeral 605; page 15, paragraph 43, line 28 through page 17, paragraph 46, line 28);

specifying at least some of the plurality of physical disk drives (Fig. 6, reference numeral 605; page 15, paragraph 43, line 28 through page 17, paragraph 46, line 28) for inclusion in a storage cell (Fig. 4, reference numeral 403; page 14, paragraph 40, line 28 through page 15, paragraph 40, line 6);

creating a storage cell object (Fig. 7, reference numeral 727; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) representing the storage cell (Fig. 4, reference numeral 403; page 14, paragraph 40, line 28 through page 15, paragraph 40, line 6) wherein the physical store objects (Fig. 7, reference numeral 712; page 18, paragraph 48, line 1 through page 21, paragraph 54, line 27) corresponding to the specified physical disk drives (Fig. 6, reference numeral 605; page 15, paragraph 43, line 28 through page 17, paragraph 46, line 28) are included in the created storage cell (Fig. 4, reference numeral 403; page 14, paragraph 40, line 28 through page 15, paragraph 40, line 6).

Claim 17

Claim 17 is directed to a method for facilitating management of virtual storage in a storage area network enabling a user can flexibly present a virtual disk to a host, comprising:

connecting a host (107) to a network storage controller (NSC) (Fig. 5, reference numeral 501; page 15, paragraph 42, lines 15-28) via a host agent capable of communicating command-response traffic with logical objects implemented in the network storage controller (Fig. 5, reference numeral 501; page 15, paragraph 42, lines 15-28);

creating a logical disk object (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) representing a virtual storage container, wherein the logical disk (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) is an abstract representation of physical storage capacity provided by plurality of physical stores (Fig. 7, reference numeral 712; page 18, paragraph 48, line 1 through page 21, paragraph 54, line 27);

adding a storage protocol to the logical disk object (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) using a derived disk object (Fig. 7, reference numeral 723; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) in response to a user protocol selection;

associating the derived object (Fig. 7, reference numeral 723; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) with a host using a presented disk object (Fig. 7, reference numeral 724; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) referencing the host agent in response to a user host selection; and

creating a virtual disk object (Fig. 1, reference numeral 102; page 9, paragraph 26, line 1 through page 12, paragraph 34, line 31) comprising the logical disk object (Fig. 7, reference numeral 722; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3), the derived

disk object (Fig. 7, reference numeral 723; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3) and the presented disk object (Fig. 7, reference numeral 724; page 21, paragraph 55, line 31 through page 24, paragraph 61, line 3).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-18 are anticipated under 35 U.S.C. §102(e) by U.S. Patent No. 6,538,669 to Lagueux et al. (the '669 patent).

ARGUMENT

I. The '669 Patent Cannot Anticipate the Pending Claims

A. Legal Standard

The standard for lack of novelty, that is, for "anticipation," under 35 U.S.C. §102 is one of *strict identity*. To anticipate a claim for a patent, a single prior source must contain all its essential elements. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 90 (Fed. Cir. 1986). Invalidity for anticipation requires that all of the elements and limitations of the claims be found within a single prior art reference. *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 18 USPQ2d 1001 (Fed. Cir. 1991). Every element of the claimed invention must be literally present, arranged as in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). "The *identical* invention must be shown in as complete detail as is contained in the patent claim." MPEP §2131 (7th Ed. 1998) (citing *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). Furthermore, functional language, preambles, and language in "whereby," "thereby," and "adapted to" clauses cannot be disregarded. *Pac-Tec, Inc. v. Amerace Corp.*, 14 USPQ2d 1871 (Fed. Cir. 1990).

"It is by now well settled that the burden of establishing a *prima facie* case of anticipation resides with the Patent and Trademark Office." *Ex parte Skinner*, 2 USPQ2d 1788, 1788-1789 (Bd. Pat. Int. 1986) (holding that examiner failed to establish *prima facie* case of anticipation). The examiner has "the burden of proof . . . to produce the factual basis for its rejection of an application under sections 102 or 103." *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) (quoting *In re Warner*, 379 F.2d 1011, 1016, 154 USPQ 173, 177 (CCPA 1967)). Only if that burden is met, does the burden of going forward shift to the applicant.

B. The '669 Patent Fails to Disclose Elements Recited in Claim 1

Independent claim 1 recites a first limitation directed to:

a virtualized logical disk object representing a virtual storage container, wherein the virtualized logical disk is an abstract representation of physical storage capacity provided by plurality of physical stores.

The final Action appears to assert that the LUN described in the '669 patent discloses this limitation, and cites the LUN described in column 7, column 8, lines 25-35, and column 17 to support the assertion.

Independent claim 1 recites a second, *separate* limitation directed to:

a virtual disk object representing a virtual storage container, wherein the virtual disk object is an abstract representation of one or more virtualized logical disk objects, the virtual disk object including an exposed management interface.

The final Action appears to assert that the same LUN described in the '669 patent discloses this limitation, and cites column 2, lines 5-58, and column 7 lines 5-30, and Fig. 2 to support the assertion.

Initially, Applicants contend that the rejection is improper because the rejections asserts that the same entity (i.e., the LUN described in the '669 patent) corresponds to two separate and distinct elements of the claim. Independent claim 1 recites two separate and distinct elements: (1) a virtualized logical disk object, *which is an abstract representation of physical storage capacity provided by physical stores*; and (2) a virtual disk object, *which is an abstract representation of one or more virtualized logical disk objects*. To support a rejection under 35 U.S.C. §102, the Action must demonstrate that the '669 patent discloses the elements of the claim arranged as they are in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The single LUN described in the '669 patent cannot (and does not) correspond to the two distinct elements recited in claim 1. Therefore, the

rejection is improper and should be overturned.

Further, the '669 patent fails to disclose elements of the claim. As noted above, independent claim 1 recites a second, *separate* limitation directed to:

a virtual disk object representing a virtual storage container, wherein the virtual disk object is an abstract representation of one or more virtualized logical disk objects, the virtual disk object including an exposed management interface.

The final Action appears to assert that the same LUN described in the '669 patent discloses this limitation, and cites column 2, lines 5-58, and column 7 lines 5-30, and Fig. 2 to support the assertion. Applicants disagree. Column 2, lines 5-58 reads as follows:

The storage server according to the present invention includes a plurality of communication interfaces. A first set of communication interfaces in the plurality is adapted for connection to all kinds of users of data. A second set of communication interfaces in the plurality is adapted for connection to respective devices in a pool of storage devices. The user interface provides tools for configuring data processing resources in the server coupled to the plurality of communication interfaces for transferring data among the interfaces. The data processing resources comprise a plurality of driver modules and configurable logic linking driver modules into data paths. Each configured data path acts as a virtual circuit that includes a set of driver modules selected from the plurality of driver modules. A data storage transaction which is received at a communication interface is mapped to one of the configured data paths according to the initiating host and according to the logical address of the storage extent subject of the transaction.

The user interface includes tools to configure virtual devices and virtual circuits, having a logical address such as a LUN number and target device identifier, to a set of physical storage devices coupled to communication interfaces in the storage server, and a set of client hosts coupled to communication interfaces in the storage server.

The user interface provides tool for configuration of the storage system. It comprises a display and a user input device, such as a mouse, touch screen or other pointing device. Data processing structures are coupled with the display and the user input device, which include logic to manage images displayed on the display, either simultaneously in groups, in a logical sequence, or in an interactive sequence. The images include first image arranged to prompt the user to input data concerning host systems coupled to the server, the second image arranged to prompt the user to input data concerning storage resources including virtual devices and physical storage devices accessible using the server, and a third image arranged to prompt a user to input data concerning logical addresses used by the host systems access the storage resources. Also, a communication interface is included that is arranged to provide the input data to the server.

For a storage system supporting a plurality of host systems, the first image includes a graphic tool allowing a user to add a host to the plurality of host systems. Also, the first image may comprise the display construct, such as a table listing host systems available for configuration. The preferred embodiment, the table includes for each entry a host name field, a port number field for an identifier of the port in the server, and a protocol ID field for an identifier of the host for used by a storage channel protocol. Other fields can be included, such as a description field for a description of an associated host, and a unique identifier field, such as the field for a World Wide Name.

Column 7, lines 5-30 reads as follows:

The block storage interface 118 provides software modules to support block data transfers. The interface 118 includes support for striped data storage, mirrored data storage, partitioned data storage, memory cache storage, and RAID storage. The different supported storage types can be linked to form various combinations such as a mirrored data storage with a memory cache.

The protocol interface 122 provides software modules for translating and responding to requests in a variety of protocols. One set of modules is provided for the layers of an Ethernet connection: the hardware driver, the data link driver, the Internet protocol (IP) driver, the transmission control protocol (TCP) driver, the user datagram protocol (UDP) driver, and other drivers. Another set of modules provides drivers for FCP.

The management interface 120 provides software modules for managing the ISAN server 102A. The management interface 120 contains interfaces for managing access to the tables 116. The management interface 120 also contains interfaces for rules based management of the system including: scheduling, or process orchestration; monitoring the system; informed consent management; and handling system processes and events. The informed consent management module is premised on providing rules based management suggestions for configuring and maintaining the ISAN server 102A.

Nothing in this text discloses (or even suggests) *a virtual disk object representing a virtual storage container, wherein the virtual disk object is an abstract representation of one or more virtualized logical disk objects, the virtual disk object including an exposed management interfaces, as recited in claim 1.*

Independent claim 1 further recites a limitation directed to:

wherein the virtual disk object is managed through the management interface to select the one or more logical disk objects represented by the virtual disk object.

The final Action appears to assert that the '669 patent discloses this limitation, and

cites column 2, lines 20-67 to support the assertion. Applicants disagree. Column 2, lines

20-67 reads as follows:

The user interface includes tools to configure virtual devices and virtual circuits, having a logical address such as a LUN number and target device identifier, to a set of physical storage devices coupled to communication interfaces in the storage server, and a set of client hosts coupled to communication interfaces in the storage server.

The user interface provides tool for configuration of the storage system. It comprises a display and a user input device, such as a mouse, touch screen or other pointing device. Data processing structures are coupled with the display and the user input device, which include logic to manage images displayed on the display, either simultaneously in groups, in a logical sequence, or in an interactive sequence. The images include first image arranged to prompt the user to input data concerning host systems coupled to the server, the second image arranged to prompt the user to input data concerning storage resources including virtual devices and physical storage devices accessible using the server, and a third image arranged to prompt a user to input data concerning logical addresses used by the host systems access the storage resources. Also, a communication interface is included that is arranged to provide the input data to the server.

For a storage system supporting a plurality of host systems, the first image includes a graphic tool allowing a user to add a host to the plurality of host systems. Also, the first image may comprise the display construct, such as a table listing host systems available for configuration. The preferred embodiment, the table includes for each entry a host name field, a port number field for an identifier of the port in the server, and a protocol ID field for an identifier of the host for used by a storage channel protocol. Other fields can be included, such as a description field for a description of an associated host, and a unique identifier field, such as the field for a World Wide Name.

For storage systems supporting storage resources including a plurality of storage elements, the second image includes a graphic tool allowing a user to add a storage elements to the plurality of storage elements. For example, the preferred embodiment the second image comprises a display construct such as icons arranged in a hierarchical tree, that indicate storage elements available for configuration.

Nothing in this text discloses (or even suggests) *wherein the virtual disk object is managed through the management interface to select the one or more logical disk objects represented by the virtual disk object, as recited in claim 1.*

In sum, the '669 patent fails to meet the strict identity standard required by *Richardson v. Suzuki Motor Co.* or to disclose or suggest elements of claim 1, and therefore

cannot anticipate independent claim 1.

B. The '669 Patent Fails to Disclose Elements Recited in Claim 2

Dependent claim 2 recites:

a derived disk object coupled to the logical disk object and including methods and data structures configured to add storage protocol to the logical disk object.

The final Action asserts that the '669 patent discloses this limitation, and simply cites columns 2, 3, and 7 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants disagree. Nothing in Fig. columns 2, 3, or 7 discloses (or even suggests) that *a derived disk object coupled to the logical disk object and including methods and data structures configured to add storage protocol to the logical disk object*, as recited in claim 2. Therefore, the '669 patent cannot anticipate dependent claim 2.

C. The '669 Patent Fails to Disclose Elements Recited in Claim 3

Dependent claim 3 recites:

a presented disk object coupled to the derived disk object and including methods and data structures configured to expose an virtual disk interface to selected clients.

The final Action asserts that the '669 patent discloses this limitation, and simply cites columns 15, 20, and 21 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants disagree. Nothing in columns 15, 20, and 21 discloses (or even suggests) that *a presented disk object coupled to the derived disk object and including methods and data structures configured to expose an virtual disk interface to selected clients*, as recited in claim 3. Therefore, the '669 patent cannot anticipate dependent claim 3.

D. The '669 Patent Fails to Disclose Elements Recited in Claim 4

Dependent claim 4 recites:

a network storage controller including a processor and memory, wherein the logical disk object and virtual disk object are implemented in memory of the network storage controller.

The final Action asserts that the '669 patent discloses this limitation, and simply cites columns 2, 3, 7 and 8 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants disagree. Nothing in columns 2, 3, 7 and 8 discloses (or even suggests) that *a network storage controller including a processor and memory, wherein the logical disk object and virtual disk object are implemented in memory of the network storage controller*, as recited in claim 4. Therefore, the '669 patent cannot anticipate dependent claim 4.

E. The '669 Patent Fails to Disclose Elements Recited in Claim 5

Dependent claim 5 recites:

a set of persistent objects managed by the network storage controller, wherein the persistent objects represent hardware resources of the network storage system.

The final Action asserts that the '669 patent discloses this limitation, and simply cites column 7 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants disagree. Nothing in column 7 discloses (or even suggests) that *a set of persistent objects managed by the network storage controller, wherein the persistent objects represent hardware resources of the network storage system*, as recited in claim 5. Therefore, the '669 patent cannot anticipate dependent claim 5.

F. The '669 Patent Fails to Disclose Elements Recited in Claim 6

Dependent claim 6 recites:

a physical store object representing a physical storage device; and a volume object representing storage capacity that can be allocated from the storage device represented by the physical store object, wherein the volume object presents a logical abstraction of the physical store object.

The final Action asserts that the '669 patent discloses this limitation, and simply cites column 7 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants disagree. Nothing in column 7 discloses (or even suggests) that *a physical store object representing a physical storage device; and a volume object representing storage capacity that can be allocated from the storage device represented by the physical store object, wherein the volume object presents a logical abstraction of the physical store object*, as recited in claim 6. Therefore, the '669 patent cannot anticipate dependent claim 6.

G. The '669 Patent Fails to Disclose Elements Recited in Claim 7

Dependent claim 7 recites:

a storage cell client object representing a host management agent, wherein the storage cell client object has an interface for coupling to the management interface.

The final Action asserts that the '669 patent discloses this limitation, and simply cites column 6, line 59 through column 7 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants disagree. Nothing in column 7 discloses (or even suggests) that *a storage cell client object representing a host management agent, wherein the storage cell client object has an interface for coupling to the management interface*, as recited in claim 7. Therefore, the '669 patent cannot anticipate dependent claim 7.

H. The '669 Patent Fails to Disclose Elements Recited in Claim 8

Dependent claim 8 recites:

the storage cell client object is capable of representing a host management agent located in any network-coupled computing device.

The final Action asserts that the '669 patent discloses this limitation, and cites column 7, lines 10-20 to support the rejection. Applicants disagree. The cited text reads as follows:

The block storage interface 118 provides software modules to support block data transfers. The interface 118 includes support for striped data storage, mirrored data storage, partitioned data storage, memory cache storage, and RAID storage. The different supported storage types can be linked to form various combinations such as a mirrored data storage with a memory cache.

The protocol interface 122 provides software modules for translating and responding to requests in a variety of protocols. One set of modules is provided for the layers of an Ethernet connection: the hardware driver, the data link driver, the Internet protocol (IP) driver, the transmission control protocol (TCP) driver, the user datagram protocol (UDP) driver, and other drivers. Another set of modules provides drivers for FCP.

Nothing in this text discloses (or even suggests) *the storage cell client object is capable of representing a host management agent located in any network-coupled computing*

device, as recited in claim 8. Therefore, the '669 patent cannot anticipate dependent claim 8.

I. The '669 Patent Fails to Disclose Elements Recited in Claim 9

Independent claim 9 recites a first limitation directed to:

specifying at least some of the plurality of physical disk drives for inclusion in a storage cell.

The final Action appears to assert that the LUN described in the '669 patent discloses this limitation, and cites column 15, lines 20-45, to support the assertion. Applicants disagree. Column 15, lines 20-45 reads as follows:

In the example illustrated in FIG. 12, the external interface is provided by the NIC #0, and its associated HDM is represented by block 1010. The protocol translator is provided by the SCSI target server ISM 1011. A cache function is provided by the ISM 1012. A mirror function is provided by the ISM 1013. The storage objects are accessed from the mirror function 1013, and consist of a set of physical storage interfaces selected in this example from the fiber channel basic daisy chain interface and its associated HDM represented by block 1014 or an external LUN interface, the disk drives in the fiber channel arbitrated loop accessed through the ISM/HDM pair represented by block 1015 and the redundant block 1016, the solid state storage device and its associated HDM represented by block 1017, and the interface to an external disk drive and its associated ISM/HDM pair represented by block 1018. Separate HDM modules on each of the fiber channels interfaces to disks (01), (02), (03), and (04) manage the communication across the fiber channel arbitrated loops with the interfaces 1015 and 1016.

In the embodiment shown, the mirror module 1013 accesses disks (01), (02), and (04) as the primary, secondary and standby drives, respectively, for the mirror functions. Although the mirror module shown in FIG. 9 includes the tertiary drive interface, this tertiary drive is not used in the example system.

Contrary to the assertion in the Action, nothing in this text discloses (or even suggests) *specifying at least some of the plurality of physical disk drives for inclusion in a storage cell*, as recited in claim 9.

Independent claim 9 recites a second limitation directed to:

creating a storage cell object representing the storage cell wherein the physical store objects corresponding to the specified physical disk drives are included in the created storage cell.

The final Action asserts that the '669 patent discloses this limitation, and cites columns 8, 9, and Fig. 24 to support the rejection. Applicants traverse this rejection, and

assert that the Action fails to establish a *prima facie* case of anticipation. The Action provides *no support whatsoever* for the assertion. Applicants disagree. Nothing in columns 8, 9 or Fig. 24 discloses (or even suggests) that *creating a storage cell object representing the storage cell wherein the physical store objects corresponding to the specified physical disk drives are included in the created storage cell*, as recited in claim 9.

In sum, the '669 patent fails to meet the strict identity standard required by *Richardson v. Suzuki Motor Co.* or to disclose or suggest elements of claim 9, and therefore cannot anticipate independent claim 9.

J. The '669 Patent Fails to Disclose Elements Recited in Claim 13

Dependent claim 13 recites:

verifying that at least four physical store objects were specified before creating the storage cell object.

The final Action asserts that the '669 patent discloses this limitation, and cites Fig. 4 and Fig. 6 to support the rejection. Applicants traverse this rejection, and assert that the Action fails to establish a *prima facie* case of anticipation. Neither Fig. 4 nor Fig. 6 disclose (or even suggest) specific operations associated with a port, much less that *verifying that at least four physical store objects were specified before creating the storage cell object*, as recited in claim 13. Therefore, the '669 patent cannot anticipate claim 13.

K. The '669 Patent Fails to Disclose Elements Recited in Claim 14

Dependent claim 14 recites:

verifying that sufficient physical store objects were specified to satisfy the requested device failure protection level before creating the storage cell object.

The final Action asserts that the '669 patent discloses this limitation, and cites columns 15, 16, and 20 to support the rejection. Applicants traverse this rejection, and assert that the Action fails to establish a *prima facie* case of anticipation. Neither columns 15, 16, nor 20 disclose (or even suggest) specific operations associated with a port, much less that *verifying that sufficient physical store objects were specified to satisfy the requested device failure protection level before creating the storage cell object*, as recited in claim 14. Therefore, the '669 patent cannot anticipate claim 14.

L. The '669 Patent Fails to Disclose Elements Recited in Claim 15

Dependent claim 15 recites:

verifying that ports on the network storage controller are operational before creating the storage cell object.

The final Action asserts that the '669 patent discloses this limitation, and simply cites column 16 through column 18 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants traverse this rejection, and assert that the Action fails to establish a *prima facie* case of anticipation. Nothing in columns 16-18 discloses (or even suggests) that *verifying that ports on the network storage controller are operational before creating the storage cell object*, as recited in claim 15. Therefore, the '669 patent cannot anticipate claim 15.

M. The '669 Patent Fails to Disclose Elements Recited in Claim 16

Dependent claim 16 recites:

verifying that all of the selected physical store objects are in an operational condition before creating the storage cell object.

The final Action asserts that the '669 patent discloses this limitation, and simply cites column 16 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants traverse this rejection, and assert that the Action fails to establish a *prima facie* case of anticipation. Nothing in column 16 discloses (or even suggests) that *verifying that all of the selected physical store objects are in an operational condition before creating the storage cell object*, as recited in claim 16. Therefore, the '669 patent cannot anticipate claim 16.

N. The '669 Patent Fails to Disclose Elements Recited in Claim 17

Independent claim 17 recites a first limitation directed to:

creating a logical disk object representing a virtual storage container,
wherein the logical disk is an abstract representation of physical storage
capacity provided by plurality of physical stores.

The final Action appears to assert that the LUN described in the '669 patent discloses this limitation, and cites the LUN described in column 16 lines 35-67, column 17 and Fig. 24 to support the assertion.

Independent claim 17 recites a second, *separate* limitation directed to:

creating a virtual disk object comprising the logical disk object, the
derived disk object and the presented disk object.

The final Action appears to assert that the same LUN described in the '669 patent discloses this limitation, and cites Table 1, Export Table, Table 2, and columns 17-18 to support the assertion.

Again, Applicants contend that the rejection is improper because the rejections asserts that the same entity (i.e., the LUN described in the '669 patent) corresponds to two separate and distinct elements of the claim. Independent claim 17 recites two separate and distinct elements: (1) creating a logical disk object . . . *which is an abstract representation of physical storage capacity provided by plurality of physical stores*; and (2) creating a virtual disk object *comprising the logical disk object, the derived disk object and the presented disk object*. To support a rejection under 35 U.S.C. §102, the Action must demonstrate that the '669 patent discloses the elements of the claim arranged as they are in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The single LUN described in the '669 patent cannot (and does not) correspond to the two distinct elements recited in claim 17. Therefore, the rejection is improper and should be overturned.

Further, the '669 patent fails to disclose elements of the claim. As noted above, independent claim 17 recites a limitation directed to:

adding a storage protocol to the logical disk object using a derived disk object in response to a user protocol selection.

The final Action asserts that the '669 patent discloses this limitation, and simply cites columns 2-3 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants traverse this rejection, and assert that the Action fails to establish a *prima facie* case of anticipation. Nothing in Fig. columns 2-3 discloses (or even suggests) *adding a storage protocol to the logical disk object using a derived disk object in response to a user protocol selection*, as recited in claim 17. Therefore, the '669 patent cannot anticipate claim 17.

Independent claim 17 recites a second, *separate* limitation directed to:

creating a virtual disk object comprising the logical disk object, the derived disk object and the presented disk object.

The final Action appears to assert that the same LUN described in the '669 patent discloses this limitation, and cites Table 1, Export Table, Table 2, and columns 17-18 to support the assertion. Applicants disagree. A close review of Table 1 and the accompanying text reveals that Table 1 merely illustrates addressing information that can be used to route the request to a virtual circuit, and Table 2 illustrates mapping virtual devices to supporting device drivers. Further, The Action provides *no support whatsoever* for the assertion. Applicants traverse this rejection, and assert that the Action fails to establish a *prima facie* case of anticipation. Nothing in Fig. column 16 discloses (or even suggests) *creating a virtual disk object comprising the logical disk object, the derived disk object and the presented disk object*, as recited in claim 17.

In sum, the '669 patent fails to meet the strict identity standard required by

Richardson v. Suzuki Motor Co. or to disclose or suggest elements of claim 17, and therefore cannot anticipate independent claim 17.

O. The '669 Patent Fails to Disclose Elements Recited in Claim 18

Dependent claim 18 recites:

providing the user protocol selection and the user host selection via a management console having a computer interface and communicating the user selections to the host agent.

The final Action asserts that the '669 patent discloses this limitation, and simply cites columns 2-3 to support the rejection. The Action provides *no support whatsoever* for the assertion. Applicants traverse this rejection, and assert that the Action fails to establish a *prima facie* case of anticipation. Nothing in columns 2-3 discloses (or even suggests) that *providing the user protocol selection and the user host selection via a management console having a computer interface and communicating the user selections to the host agent*, as recited in claim 18. Therefore, the '669 patent cannot anticipate claim 18.

CONCLUSIONS

The '669 patent fails to disclose each limitation of the pending claims. Therefore, neither the '669 patent cannot be used to establish the required *prima-facie* case of anticipation under 35 U.S.C. §102. Appellants urge the Board to reverse the examiner's rejections under 35 U.S.C. §102 of claims 1-18.

Respectfully submitted,

Jed W. Caven
Caven & Aghevli LLC
Attorney for Applicants

A handwritten signature in black ink, appearing to read 'Jed W. Caven', with a large, stylized initial 'J' and 'C'.

By:
Jed W. Caven
Registration No. 40,551
(720) 841-9544

Date: July 25, 2006

APPENDIX A

Claims

1. A system for managing virtualized data storage, comprising:
 - a virtualized logical disk object representing a virtual storage container, wherein the virtualized logical disk is an abstract representation of physical storage capacity provided by plurality of physical stores; and
 - a virtual disk object representing a virtual storage container, wherein the virtual disk object is an abstract representation of one or more virtualized logical disk objects, the virtual disk object including an exposed management interface; and
 - wherein the virtual disk object is managed through the management interface to select the one or more logical disk objects represented by the virtual disk object.
2. The system of claim 1 further comprising:
 - a derived disk object coupled to the logical disk object and including methods and data structures configured to add storage protocol to the logical disk object.
3. The system of claim 2 further comprising:
 - a presented disk object coupled to the derived disk object and including methods and data structures configured to expose an virtual disk interface to selected clients.
4. The system of claim 1 further comprising:
 - a network storage controller including a processor and memory, wherein the logical disk object and virtual disk object are implemented in memory of the network storage controller.

5. The system of claim 4 further comprising a set of persistent objects managed by the network storage controller, wherein the persistent objects represent hardware resources of the network storage system.

6. The system of claim 1, further comprising:

a physical store object representing a physical storage device; and a volume object representing storage capacity that can be allocated from the storage device represented by the physical store object, wherein the volume object presents a logical abstraction of the physical store object.

7. The system of claim 1 further comprising:

a storage cell client object representing a host management agent, wherein the storage cell client object has an interface for coupling to the management interface.

8. The system of claim 1 wherein the storage cell client object is capable of representing a host management agent located in any network-coupled computing device.

9. A method for managing virtual storage in a storage area network, the method comprising:
- providing at least one network storage controller coupled to a plurality of physical disk drives implementing physical storage capacity;
 - creating a physical store object representing each of the plurality of physical disk drives;
 - specifying at least some of the plurality of physical disk drives for inclusion in a storage cell;
 - creating a storage cell object representing the storage cell wherein the physical store objects corresponding to the specified physical disk drives are included in the created storage cell.
10. The method of claim 9 wherein the act of specifying comprises:
- obtaining user specifications of a required failure protection level; and obtaining user specifications of a set of physical disk drives.
11. The method of claim 10 further comprising creating a volume record on each of the physical disk drives included in the created storage cell.
12. The method of claim 9 further comprising creating a management logical disk object storing metadata describing the created storage cell object.
13. The method of claim 9 further comprising:
- verifying that at least four physical store objects were specified before creating the storage cell object.

14. The method of claim 10 further comprising:

verifying that sufficient physical store objects were specified to satisfy the requested device failure protection level before creating the storage cell object.

15. The method of claim 10 further comprising:

verifying that ports on the network storage controller are operational before creating the storage cell object.

16. The method of claim 10 further comprising:

verifying that all of the selected physical store objects are in an operational condition before creating the storage cell object.

17. A method for facilitating management of virtual storage in a storage area network enabling a user can flexibly present a virtual disk to a host, comprising:

connecting a host to a network storage controller (NSC) via a host agent capable of communicating command-response traffic with logical objects implemented in the network storage controller;

creating a logical disk object representing a virtual storage container, wherein the logical disk is an abstract representation of physical storage capacity provided by plurality of physical stores;

adding a storage protocol to the logical disk object using a derived disk object in response to a user protocol selection;

associating the derived object with a host using a presented disk object referencing the host agent in response to a user host selection; and

creating a virtual disk object comprising the logical disk object, the derived disk object and the presented disk object.

18. The method of claim 17, further including providing the user protocol selection and the user host selection via a management console having a computer interface and communicating the user selections to the host agent.

Evidence Appendix

None

Related Proceedings Appendix

None